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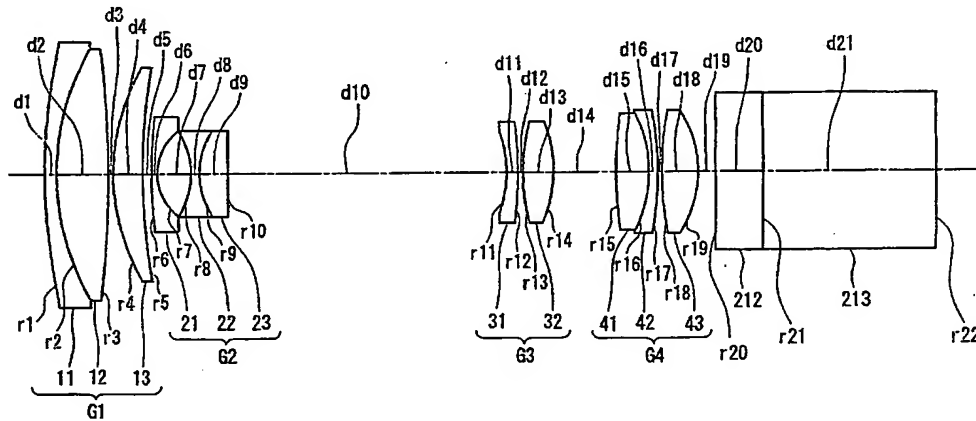
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- (51) 国際特許分類: G02B 15/16, 13/18 (72) 発明者; および
(21) 国際出願番号: PCT/JP2004/002987 (75) 発明者/出願人 (米国についてのみ): 山田 克 (YAMADA, Katsu).
(22) 国際出願日: 2004 年 3 月 8 日 (08.03.2004) (74) 代理人: 特許業務法人池内・佐藤アンドパートナーズ (IKEUCHI SATO & PARTNER PATENT ATTORNEYS); 〒5306026 大阪府大阪市北区天満橋1丁目8番30号OAPタワー26階 Osaka (JP).
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[続葉有]

(54) Title: SMALL ZOOMING LENS, AND DIGITAL CAMERA AND VIDEO CAMERA BOTH HAVING SAME

(54) 発明の名称: 小型ズームレンズ、及びこれを用いたデジタルカメラとビデオカメラ



(57) Abstract: A first lens group (G1) fixed relative to the image plane comprises a lens (11) having negative refractive power, a lens (12) having positive refractive power, and a lens (13) having positive refractive power. A second lens group (G2) has negative refractive power as a whole and is movable along the optical axis to bring about a magnifying action. The image plane is varied with the movement of the second lens group (G2) along the optical axis and of the object. The diaphragm is fixed relative to the image plane. A third lens group (G3) comprises a lens (31) having negative refractive power and a lens (32) having positive refractive power, has a positive or negative refractive power as a whole, and is fixed relative to the optical axis when the magnification is varied and the zooming lens is focused. A fourth lens group (G4) has positive refractive power as a whole and is movable along the optical axis so as to keep the image plane at a certain position. In such a way, a small, compact zooming lens bringing a high quality of image and preferable to 3CCD cameras is realized.

(57) 要約: 像面に対して固定の第1レンズ群 (G1) は、負の屈折力のレンズ (11)、正の屈折力のレンズ (12)、及び正の屈折力のレンズ (13) を含む。第2レンズ群 (G2) は、全体として負の屈折力を有し、光軸上を移動して変倍作用をもたらす。絞りは像面に対して固定される。第3レンズ群 (G3) は、負の屈折力のレンズ (31) と正の屈折力のレンズ (32) とを含み、全体として正又は負の屈折力を有し、変倍及び合焦時に光軸方向に対して固定される。第4レンズ群 (G4) は、全体として正

[続葉有]



SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.

- (84) 指定国 (表示のない限り、全ての種類の広域保護が可能): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

添付公開書類:

- 国際調査報告書
- 補正書

2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/002987

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl⁷ G02B15/16, G02B13/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl⁷ G02B15/16, G02B13/18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1926-1996 Toroku Jitsuyo Shinan Koho 1994-2004
Kokai Jitsuyo Shinan Koho 1971-2004 Jitsuyo Shinan Toroku Koho 1996-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 9-281391 A (Canon Inc.), 31 October, 1997 (31.10.97), Full text; all drawings & US 6178049 B1 & US 6226130 B1	1-7, 9-14 8
X A	JP 2000-121940 A (Canon Inc.), 28 April, 2000 (28.04.00), Full text; all drawings (Family: none)	1-7, 9-14 8
X A	JP 2000-305016 A (Canon Inc.), 02 November, 2000 (02.11.00), Full text; all drawings (Family: none)	1-7, 9-14 8

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

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27 April, 2004 (27.04.04)

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Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/002987

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2000-347103 A (Sony Corp.), 15 December, 2000 (15.12.00),	1-2, 4-7, 13-14
Y	Full text; all drawings	3, 9
A	(Family: none)	8, 10-12
X	JP 2001-51196 A (Sony Corp.), 23 February, 2001 (23.02.01),	1-2, 4-7, 13-14
Y	Full text; all drawings	3, 9
A	(Family: none)	8, 10-12
X	JP 2001-116996 A (Matsushita Electric Industrial Co., Ltd.),	1-2, 4-8, 13-14
Y	27 April, 2001 (27.04.01),	3, 9
A	Full text; all drawings (Family: none)	10-12
X	JP 2001-66717 A (Canon Inc.),	1-2, 4-7, 9-14
Y	16 March, 2001 (16.03.01),	3
A	Full text; all drawings (Family: none)	8
X	JP 2001-228394 A (Canon Inc.),	1-2, 4-7, 9-14
Y	24 August, 2001 (24.08.01),	3
A	Full text; all drawings (Family: none)	8
X	JP 2002-131638 A (Canon Inc.),	1-2, 4-8, 9-14
Y	09 May, 2002 (09.05.02),	3
A	Full text; all drawings (Family: none)	8